APPENDIX H. REFRIGERATOR, BLOOD, 4110-01-506-0895 - PMCS PROCEDURES

1. The following is a list of TMDE required for the complete PMCS of the ACUTEMP model: HMC-MIL-1 Blood Refrigerator unit.

TMDE ITEM REQUIRED	TMDE ITEM USED
Digital Thermometer	
Safety Analyzer	
Computer (for data log downloads)	

2. This item requires a DA Label 2163 (CVC) with a Frequency of "A" and code of "I".

Note: When unit is in storage, every attempt should be made to ensure the batteries are charged IAW the manufacturer's recommendations.

3. PMCS Checklist

a. Visual checks

(1) Check for NSN label. The item may or may not have a label on the side.

(2) Check for external/internal damage

(3) Verify that all accessories are available.
(a) Stainless Steel blood bag baskets: one set of 10 each. (check for sharp burs on the basket and shave as necessary)
(b) 40 amp hour battery set, two 20 amp hour batteries: set of 2 each
(c) AC power cord
(d) DC power cord
(e) Operation and Maintenance manuals (hard copy 1 each)
(f) Service and Repair manual (hard copy 1 each)
(g) Operation and Service Manual on CD (1 each)
(h) Service and Repair manual on CD (1 each)
(i) Hemalog software CD (1 each)
(j) Sponge (1 each)
(k) Screwdriver (1 each)
(l) Replacement filters (10 each)

(4) Inspect unit's LCD display which should be centered in the window.

(5) Inspect unit's LED display, it should be clearly visible without any obstructions. The manufacturer and USAMMA have determined that visibility of ¾ of the circle on the LED is the minimum acceptable. It was agreed that the items will be no less than ¾ of the LED circular area.

(6) Inspect unit for missing internal blood baskets.

(7) Inspect unit's exterior for missing hardware such as missing vents or filters.

(8) Inspect unit's latches and verify they are able to close. **CAUTION: Some are too far away from each other which will cause excessive strain on the plastic components of the refrigerator.**

(9) Inspect Lithium battery cover holder for broken clips. **CAUTION: These clips enable the cover to latch to the holder itself and are susceptible to breaking.**

(10) Inspect unit's serial number at power up on the displayed LCD screen.

(11) Inspect the cooling fan is blowing on the side of the unit.

(12) Inspect inner tub/payload of unit for any irregular appearance of the plastic liner.

(13) Inspect the battery percentage is 100% after 24 hours of continuous charge.

(14) Inspect the LCD display for any error coded on the screen relating to the battery. (NOTE: A zero value listed on the data log in the battery charge section along with an error code on the LCD means the control board needs replacement.)

(15) Check Service Mode: Press and hold **"MODE"** for 3 to 5 sec. Then press **"DISPLAY"** once, verify that the top right of the screen displays a **"K:_____I"** (when the lid is closed; and that it displays an **"L"** when opened, L will not be present K:_____. This verifies that the magnets on the lid are getting read by the unit.

b. Verify firmware version procedure

(1) Operational enhancements to the HemaCool 5 firmware were last made on 19 May 2005. There were adjustments made to the control algorithms which allow the units to maintain COOL and FREEZE set point temperatures under more extreme conditions. Units with firmware dates prior to 19 May 2005, although not necessary for proper operation, should be considered for firmware upgrades that may potentially improve their already noteworthy performance.

(2) An additional change that was implemented in the 19 May 2005 firmware is the elimination of the annoying audible alarm that is emitted when the HemaCool is first conditioned. This means that when the HemaCool is first changed from IDLE to either COOL or FREEZE, the alarm will not sound until after the unit has achieved the set point.

(3) Not all HemaCool 5's are capable of running the updated firmware. To verify your unit has the latest firmware revision or is able to be upgraded, do the following:
(a) Verify your unit has a serial number 5000 or greater. The firmware upgrade is only applicable to serial numbers 5000 and greater.
(b) Plug the unit into an AC outlet and leave in IDLE mode.
(c) Depress and hold MODE key for 3-4 seconds until the display page changes to a diagnostic screen, then release.
(d) Depress and release center DISPLAY button to page to the next screen.
(e) The date at the top left hand of the screen is your firmware release date. If it displays a date prior to 19 May 05, one should consider having the unit's firmware upgraded.

(4) With the latest version (19 May 05) of the HemaLog software loaded on PC and connected to the unit with a standard serial cable, upgrading the firmware of the HemaCool is a simple 2 click process. Follow the instructions described on page 1-32 of the HemaCool Operating Instruction Manual. Contact AcuTemp Technical Support if you need the latest version of the firmware or need any assistance.

c. Performance checks.

Follow Manufacturer's Recommended Checkout Procedures

d. Cleaning.

(1) **CABINET.** Clean the exterior with mild soap and water. Never use abrasive scouring powders.

(2) **INTERIOR AND DOOR.** Wash interior compartment and door gasket with soap and water. Mix 2 tablespoons of baking soda (if available) with one quart of warm water. Do not use an abrasive powder, solvent, polish cleaner or undiluted detergent.

(3) **STAINLESS STEEL TOP.** Clean all stainless steel components of the sink using a stainless steel cleaner.

e. Packaging

(1) Pour about a pint or so of antifreeze into the pump housing and ensure there are no leaks from the sink.

(2) Pack the accessories.

(3) Wrap the sink with bubble wrap or

(4) Band the top and bottom horizontally along the folding lips of the box.

f. Tips for the Medical Equipment Repairer;

(1) Perform visual inspection on unit to be tested for discrepancies related to assembly.

(2) Read the log on the unit to determine the cycle intervals to be within the specified 4 hours tolerance at normal ambient temperatures. Battery voltages should never fall below 12.0 VDC, if it does, replace immediately. Important to input the proper date and serial number as well as time on the initial power up of the unit because this will be useful on the units data log.

(3) Thermistor of the units payload, responsible for the displayed temperature reading, is located inside the payload chamber bottom center, secured by a zip tie. Give the test equipment ample time to stabilize.

(4) If unit does not power up with ac power verified by a non working power supply led, replace board.

(5) If unit is not within tolerance, board replacement is required or the unit needs to be sent to the OEM as of this time for insulation replacement repair is required and is only performed at the manufacturer's level at this time.

(6) Upon review of the units data log, if there are missing information anomalies in the processors communication between the compressor and the CPU, separate the unit in question and tag with the appropriate tag to prevent unintended use. Example: missing codes stated on number 7 of this write up.

(7) Status codes on equipment data log:

Y/N	On/Off
L/F	Cool/Freeze
C	Compressor On
H	Heater On (Unit Goes On Cool Mode From Freeze By Activating Heater)
O	Lid Open

For additional information, contact ACUTEMP, 7610 McEwen Road, Dayton, OH 45459, U.S.A.; phone: 937-312-0114, FAX: x-1277, www.acutemp.com, www.support@acutmep.com